Subject-related communicative language competence: Exploring future information technology specialists' learning and teaching

Aissulu Kaldarova[1] ✉ ID
Tulebike Kulgildinova[2] ID
Saule Berdenova[3] ID
Gulnara Zakirova[4] ID
Svetlana Zhanabayeva[5] ID

(✉ *Corresponding Author*)

[1,2]*Kazakh Ablaikhan University of International Relations and World Languages, Almaty, Kazakhstan.*
[1]*Email:* a.kaldarova@iitu.edu.kz
[2]*Email:* tulebike@mail.ru
[3]*Akhmet Baitursynov Kostanay Regional University, Kostanay, Kazakhstan.*
[3]*Email:* berdenova_saule@mail.ru
[4,5]*International Information Technology University, Almaty, Kazakhstan.*
[4]*Email:* g.zakirova@iitu.edu.kz
[5]*Email:* s.zhanabayeva@iitu.edu.kz

Abstract

The need for IT professionals with fluency in foreign languages becomes increasingly critical as the Kazakhstani government implements steps to foster IT innovation. However, there are structural, geographical and professional imbalances in the interaction of supply and demand for IT professionals who can speak a foreign language in the modern labour market which is the main problem that is currently hindering the growth of the IT sector in Kazakhstan. The aim of this study was to assess the development of subject communicative language competencies (a) in linguistic or grammatical ability and (b) in discourse ability in first-year students for the proposed author's innovative learning technique in the educational process as well as the appropriate technological and systematic procedures. A mixed-research method was used in this study. The study involved 365 learners in the "Informatics" direction at the International University of Information Technologies in Almaty, Kazakhstan during the school year 2021-2022. According to the findings, the experiment participants did not develop subject-related communicative language competencies. The results show that the degree of capability formation is not satisfactory. 52.8% is the basic level, 41.6% is the production point and only 5.8% is the high level. Positive dynamics shaping learners' subject-related language communication competencies were identified as a result of the implementation of innovative techniques. This paper contributes to the research on teaching IT students in developing countries and highlights the most important factors that contribute to improve the level of subject-related communicative language competencies of IT students.

Keywords: Development, Exploring, IT specialists, Learning, Subject-related communicative language competence.

Contents

Contribution of this paper to the literature

This study analyzes whether the author's innovative learning technique, using innovative methods not covered in prior studies contributes to the development of subject communicative language competencies in first-year students (a) in linguistic or grammatical ability and (b) in discourse ability to increase IT students' motivation for foreign language learning and develop listening and speaking skills.

1. Introduction

According to the Education First (EF) annual report, Kazakhstan remains behind several other countries in terms of English competence. It was placed 92nd out of 100 countries in the English Proficiency Index in 2020. The situation appears to be somewhat contradictory given that multilingual education is one of Kazakhstan's top priorities in terms of education policy. English is one of the compulsory subjects of the national curriculum in all schools in the country. Moreover, the top focus in educational policy since 2004–2005 has been a trilingual model of teaching in Kazakh, Russian and English. For example, experiments on teaching in three languages were started in 2007 and carried out at 33 schools in different parts of the country. A list of initiatives that the government had to implement to encourage the establishment of trilingual education at all educational levels was included in the plan that the government established for the years 2015–2020. However, these initiatives are not well represented by different measurements and Kazakhstan has extremely low levels of English proficiency particularly when it comes to the education of IT specialists in universities. The President of the country also mentioned this problem in his address on September 1, 2023.

Kazakh experts agree that the structure of the IT market needs improvement. The primary goal is to straighten out the IT market structure and increase the share of IT services, reflecting IT investments' effectiveness (Gilch & Sieweke, 2021). The main issue continues to be the increase in the share of local content as digitization and the transition to modern technologies are mainly carried out by foreign solutions (Brunetti et al., 2020; Chauhan, Parida, & Dhir, 2022).

Kazakhstan began to experience a severe shortage of professionals with the launch of initiatives to strengthen innovation in the field of information technology which contributed to introducing Russian and Western information companies into the country's market, complicating the development of specific local businesses. Kazakhstan currently does not have an advantage in exporting IT products to other countries due to a lack of human capital. Every year, Kazakhstan produces 20,000 IT professionals but those are just the numbers. This is currently a major problem impeding the expansion of Kazakhstan's IT sector. Our education serves to highlight the necessity of offering expert IT training. How can we keep up with the industry's rapid progress, even when artificial intelligence currently impacts every aspect of life worldwide?

There is only one solution to this problem: strengthen the training of a new generation of IT experts. Educational methods must be more diversified, tasks must be closer to reality and the professional quality of teachers must be continuously improved. The most effective education in the future will be a symbiosis of classical education with elements of innovative technologies in teaching with varying degrees of participation in the educational process (Hamidi & Chavoshi, 2018; Khosravi et al., 2022; Kim, Lee, & Cho, 2022).

One of the major priorities for the country's IT education reforms is to provide foreign language learners with professional-relevant communication skills (Dos Santos, 2021). It is necessary to extend the foreign language training period to 4-5 years and make it equal to the status of a professional discipline to acquire communicative language competence (linguistic competence, intercultural competence and pragmatic competence) (Kuhail, Alturki, Alramlawi, & Alhejori, 2023) because the entire field of technology, particularly programming languages is based on keywords derived from English. As a result, English for IT professionals is on the list of required skills. This is the primary tool for communication, working with technical documentation taking part in international projects and so on. However, only foreign language textbooks and manuals have been republished in our country and as a result, the information in them has become obsolete for students (Chassignol, Khoroshavin, Klimova, & Bilyatdinova, 2018; Snyder, 2019).

The English language training specialists in our country focus more on the opportunities for teachers and the inadequate material to support the university than they do on the demands of employers and the labour market in contrast to the training of foreign professionals in the technology sector (Li, 2022). Unfortunately, the existing standards for teaching other languages in the technological specialties at the university do not provide the opportunity to acquire the necessary language level for professional creative activities. There are concerns that IT graduates cannot read professional literature; they can only reproduce topics they remember and it is difficult for them to express themselves freely in a foreign language. It is also difficult for them to participate in professional exchanges in foreign languages.

Second, since Kazakhstan joined the Bologna Process, the modernization of education has focused on the mobility of learners (Nurgaliyeva et al., 2023; Zhumash et al., 2021). Similarly, the state's educational policy resulted in a paradigm shift from the "paradigm of expertise, abilities and skills" to the "paradigm of competency" (Nagima et al., 2023). A situation has arisen in which it is necessary to change traditional methods and forms of organizing educational activities or make certain adjustments to them which have a direct connection to the

selection of the right approaches for the development of competencies required for an emerging generation of IT specialists with the recognition of the critical role of university graduates' professional competence.

Communication-oriented training for IT specialists is based on the acquisition of communication skills to develop verbal activity, cognitive processes and creative thinking. A professionally oriented communicative learning environment determines the integration of language into the trainee's professional training system to realize real and achievable tasks in professional activities.

1.1. Problem Statement

There is a growing governmental and socio-economic emphasis in our country on encouraging English language learning and making it a basic competency. The fact that Kazakhstan is a very diverse country in terms of its ethno-linguistic landscape makes the problem somewhat more difficult to solve. However, it must be recognized that there are a set of external factors that matter to a certain extent when it comes to the spread of English in a country. In general, the level of English proficiency in the former Soviet republics is usually lower than in Western countries due to the language policy of the USSR (Union of Soviet Socialist Republics), which put the Russian language first and to the attitude towards multilingual language policy and school linguistic practice in the former Soviet republics.

In the language training of IT students, a standard is adopted as the basis that reflects the pan-European competencies of foreign language proficiency. An analysis of the beginner's level of English proficiency among the learners in the IT industry that we conducted at the previous stage of the study shows that in terms of the availability of IT specialists, Kazakhstan lags behind developed countries 1.5–3 times.

In January–April 2022, a study was conducted among 1-3 year IT students at technical universities studying English. A total of 456 respondents were interviewed. Among the respondents, 70% were boys and 30% were girls due to the predominance of males in technical universities. It was revealed how students themselves assess their skills in reading, listening, speaking and writing to analyze in more detail the level of English proficiency based on the generally accepted European grading system. Thus, more than half of the respondents (53%) when reading understood the simplest, shortest information that is used in everyday communication (26%) individual words and monosyllabic sentences (survival level) and 27% of short texts (sub-threshold level). A quarter of respondents (24%) can perceive the content of more complex texts used not only in everyday communication but also in the course of professional communication (threshold level). A much smaller number of respondents demonstrate a higher level of reading comprehension. As a result, only 14% comprehend information on current issues and works of art intended for the average reader (threshold advanced level). The proportion of people who perceive large, complex texts with both artistic and technical content is even lower (7% high level). The highest level of reading (perfect level) is typical for 2% of respondents. They freely understand texts of any level of complexity. This category mainly includes male IT students studying in 2-3 technical faculties. The majority also have a very poor level of proficiency with respect to listening. According to teachers, this is the most difficult skill which includes both speaking and the perception of the interlocutor's monologue. More than a quarter of respondents (28%) understand only certain phrases and words that are most often used in everyday life. Moreover, these are usually carefully spoken words that are articulated slowly and clearly.

A quarter of the surveyed technical university students (23.6%) understood complex statements from every day and professional life. Only 8% of the respondents indicated a higher level of listening comprehension. They understand the content of films, news and reports on professional topics if they are familiar with the subject and use literary language. Approximately 7% of people perceive complex, comprehensive messages on any subject. They understand the content of films and TV shows almost effortlessly. Only 3% of the students polled understood any speech by ear even from a native speaker. In terms of speaking skills, 30% of respondents have the most basic skills; they can talk about themselves and their family using simple phrases. Approximately the same number can simply and briefly describe their work, studies, interests and acquaintances. About a quarter of respondents can express their impressions and compose a coherent text to tell a simple story or movie plot.

1.2. Questions for Research

Q1: What is the current level of subject-related communicative language competencies (a) in linguistic or grammatical ability and (b) in discourse ability among information technology degree students?

Q2: What are the dynamics of the development of subject-related communicative language competencies (a) in linguistic or grammatical ability and (b) in discourse ability in IT learners after introducing an author's innovative technique of learning in the educational process?

1.3. Objectives

The aim of this study was to assess the development of subject communicative language competencies (a) in linguistic or grammatical ability and (b) in discourse ability in first-year students for the proposed author's innovative learning technique in the educational process as well as the appropriate technological and systematic procedures.

2. Literature Review

The modern, high-tech information world is a space of limitless communication opportunities (Asghar, Memon, & Hämäläinen, 2022). These processes radically change education and determine the transition from "education of knowledge transfer" to the need for the formation of communicative competencies in the context of international integration and professional migration. As a result, when communication is essential to a learner's ability to succeed in their professional activities, globalization determines foreign language instruction (Xu & Xiao, 2023).

Communicative competence is basic competence in teaching another language and is presented "as a combination of sociolinguistic, pragmatic and linguistic in nature (Whyte, 2019). According to Döbler, Emmermacher, Richter-Killenberg, Nowak, and Wegge (2022), one of the essential criteria for programmers' mastery is the development of their communicative competence. The best programmers are the ones who have

participated in the most diverse projects, group meetings and consulting sessions. However, very few IT students develop communication skills making it difficult for companies to hire existing experts who value communication skills over professional skills.

A foreign language has vast educational and developmental potential and contributes to completing the tasks provided for training experts (Abragan, Abarcas, Aquino, & Bagongon, 2022). Foreign language teaching is a priority in the education of IT students and is an integral part of the IT faculty's activities.

Language knowledge that enables the performance of foreign language communicative activities contributes to the individual's development and self-improvement for the effective performance of professional tasks and integrates linguistic, sociocultural and professional competencies for effective foreign language communication (Kiessling & Fabry, 2021). These definitions combine the understanding of professional communicative competence in another language to build a constructive dialogue in society by representatives of different linguistic professional cultures, ensuring the productivity of work in a professional team or student group to achieve a certain result (MacIntyre & Wang, 2021; Tang & Hew, 2022). In this regard, the special role of the English language for professional interaction including network interaction should be noted because knowledge of another language contributes to direct communication with representatives of the international professional community themselves (Gronseth & Hebert, 2019; Lu, Sanitah, & Huang, 2022).

Modern reality is an augmented reality where digital technologies when used correctly and incorporated into the educational process contribute to genuine communication and real issue solving in modern society (Alkhabra, Ibrahem, & Alkhabra, 2023; Alzahrani, 2020; Arena, Collotta, Pau, & Termine, 2022).

The information saturation of the educational environment is a feature of the modern educational process, which necessitates the active use of Internet resources and online technologies as well as the use of interactive forms of instruction (Dhawan, 2020; Iglesias-Pradas, Hernández-García, Chaparro-Peláez, & Prieto, 2021; Lapitan Jr, Tiangco, Sumalinog, Sabarillo, & Diaz, 2021).

Intercultural communication and worldwide transformations in the IT sector necessitate the development of a new set of skills and competencies for rational functioning in a multicultural world (Ilie, 2019; Köşker & Gülmez, 2018). Intercultural communication and worldwide transformations in the IT sector necessitate the development of a new set of skills and competencies for rational functioning in a multicultural world. Foreign language proficiency is also required for the successful completion of the tasks assigned. This knowledge will assist in keeping up with global achievements and developments by participating in international symposiums and conferences, establishing friendly relations and working in transnational collectives.

From a structural point of view, the subject communicative language of information technology experts is a combination of special blocks, social behavior blocks and communicative blocks which are composed of more specific parts. The content of the subject-related communicative language is a set of language knowledge and speech skill traits of students, the acquisition of which provides an opportunity for practical knowledge and situations of professional communication and the university graduates' readiness for other language communication (Achille & Fiorillo, 2022; Cuenca-López, Martín-Cáceres, & Estepa-Giménez, 2021; Savignon, 2018). Teaching students a professional second language using active instruction, co-teaching methods and a combination of innovative and traditional techniques can make the most effective education.

The following question to consider is: what communication skills exist and which competencies stand out in their structure? The main objective of teaching a non-native (professional) language will be to improve the linguistic, sociolinguistic, strategic, social and sociocultural competencies acquired in previous stages of the language acquisition process and to form the non-native professional communicative competence of bachelor students required for business and professional communication on this basis.

The following are the tasks associated with studying the discipline:

Development of the level of linguistic competence formation.

Development of communicative competence through various types of speech activity.

Further development of socio-cultural competence based on authentic educational materials.

Professional communicative competence in a foreign language is developed through the process of working with original scientific and technical literature texts including the analysis and discussion of scientific and technical problems in the specialty's direction.

These tasks are impossible to complete without the application of various tools to the teaching process that is based on the principles of complexity, interactivity and modeling professional contextual situations that are most relevant to students' professional and practical activities, the problematic method, and project work (Amsori, Nugraha, & Sibarani, 2023; Kim, Raza, & Seidman, 2019; Pratiwi, Ubaedillah, Puspitasari, & Arifianto, 2022; Safitri, Rafli, & Dewanti, 2020).

Innovative techniques in learning are extremely important for students' development and the formation of professionally oriented communicative competence. An innovative technique in learning ensures that knowledge transfer and information access are more efficient than traditional learning tools. These facts demonstrate the innovative learning advantages over traditional. In the context of Kazakhstan, this communication-oriented training for IT specialists will be completely consistent with the concept of developing competencies for an IT specialist within the framework of an appropriate approach that can be described as "competency-based."

3. Method
3.1. Research Method
A mixed research method was used to investigate the role of the author's innovative teaching method in the development of subject-communicative language competencies among Kazakhstani students studying information technology (Corner, Murray, & Brett, 2019; Peterson, 2019). Traditionally, the use of quantitative methods for a qualitative project helps in the work on the target sample (Akyildiz & Ahmed, 2021). First, it allows to define the criteria for finding cases and selecting them in a qualitative study (Aspers & Corte, 2019; Busetto, Wick, & Gumbinger, 2020). Second, there is a systematic comparison of the selected cases which differs from the original

data. Third, information from quantitative data is used to find sources that are interesting and important. Fourth, the development of theory and practice identifies sources of data useful to theory.

3.2. Research Sample Formation

The study involved 365 first-year students at the International University of Information Technologies in Almaty, Kazakhstan during the school year 2022-2023 who were divided into two groups at random: experimental (293 participants) and control (72 participants). Thus, the randomization criteria have been met. Participants are randomly assigned to groups with varying values of the independent variable. For participants in the EG, the author's innovative technique of learning was used and in the CG, training took place according to the traditional method. The independent variables were the results of the techniques for diagnosing this researched competence before and after the author's innovative technique of learning. Gender differences were discovered with 230 men and 135 women. The participants ranged from 18 to 26 (standard deviation = 0.41). The minimization of the impact that outside variables have on the dependent variable was carried out through compliance with the rules for the selection of subjects (approximately the same age and level of training) and the experimental conditions (the same size of study groups, the same curricula and the same teachers).

3.3. Research Approach

(1) The goals we set influence the nature of the main tasks that will follow: Develop directions and determine how to proceed with the implementation of the technique for the development of subject-related communicative language competencies among information technology degree learners at the university.
(2) Identify evaluation criteria and determine the baseline for the formation of subject-related communicative language competencies among information technology degree learners.
(3) Introduce a technique for the formation of subject-related communicative language competencies among information technology degree learners and check its effectiveness by conducting diagnostic sections which will confirm the validity of the hypothesis put forward.
(4) Analyze and summarize the final results of the experimental work.

The experiment is carried out in three stages (preparatory, main and final) at each of which an experiment corresponding to the stage is carried out (stating, forming and generalizing).

In the first stage, the criteria, levels and indicators of the formation of subject-related communicative language competencies of university students for future IT, the construction of level scales and the choice of appropriate diagnostic methods.

We have identified the following criteria: *motivational criterion; intellectual criterion, activity criterion, reflexive criterion and* by studying the components of the subject-related communicative language competencies for a university student.

Three levels of formation were identified as subject-related communicative language competencies of students: basic, productive and creative. In this study, the creative level of manifestation of the criterion was estimated at 3 points: the productive level of manifestation was at 2 points and the base level was at 1 point.

3.4. Research Instrument

Various tools were used to assess learners' competencies in subject-related communicative language competencies (see Table 1).

Table 1. Techniques for assessing learners' progress in subject-related communicative language competencies.

Criterion	Indicators	Assessment methods and techniques
Motivational	Dominant motives (Stability, focus motivation for the communication process).	Interview and survey. Diagnostics of motivational orientations in interpersonal communications. Technique for diagnosing students' motivation.
Intellectual	Knowledge of the basics of subject and communicative interactions and subject skills.	Technique for measuring social intelligence. Test the "fundamental of intellectual and communicative interaction."
Activity	Communication skills and abilities	Interviewing, observation, questioning and testing. Technique for assessing the level of sociability. Technique for determining communication skills and abilities.
Reflexive	Evaluation and reflection skills	Conversation, interviewing, observation and testing. Technique for assessing the level of trainees' reflexivity.

4. Results and Discussion

We evaluated the percentage for the following levels to determine the actual level of subject-related communicative language competencies for each group: basic (up to 40%), productive (from 40% to 80%) and creative (above 80%). The percentage of the motivational component of the studied competence of students is shown in Table 2.

Table 2. The percentage of the motivational component of the studied competence.

Levels	EG 1		EG 2		EG 3		EG 4		CG	
	Participant	%	Participant	%	Participant	%	Participant	%	Participant	%
Creative	5	6 %	6	7 %	4	5%	7	8%	8	11%
Productive	29	39%	32	43%	32	42%	32	43%	29	39%
Basic	38	51%	35	47%	38	50%	35	47%	35	47%

We obtained the following average levels of this component at the start of the experiment: EG 1, 39%; EG2, 38%; experimental group EG3, 41%; EG4, 37% and control group CG 40%. The indicators obtained for all groups are consistent with the baseline.

Based on the outcomes from both the questionnaires and the interviews with students, it also showed that 34% of students study to become highly qualified IT specialists and be successful in their future professional activities, 28% of students stated that they needed to study at a university to graduate and obtain parental approval, 17% stated that they were studying to increase their level of material security in the future, 11% of participants are pursuing a diploma with high grades to gain an advantage on the IT team in front of others and 6% of students study to learn new things and engage in creative activities. Only 4% of the students surveyed like to study and gain new knowledge.

Thus, it was found that the required level of motivation of the students does not add up not only to the communication process but also to their studying at a university in general which shows the need to use any special methods, tools and technologies to develop the motivational sphere (Motta & Bennett, 2018). The information obtained during the processing of students' answers made it possible to further implement a personal approach to learning and simulate practical exercises for various categories of students to develop their motivation (Jääskä, Lehtinen, Kujala, & Kauppila, 2022).

In the findings of the "Fundamentals of Intellectual and Communicative Interaction" test, it was discovered that learners lack adequate subject knowledge and require a theoretical and practical foundation. This outcome was considered when the main content of the subject " speech communication" was filled for the development of students' subject-communicative interaction.

As a result of the diagnostics of the technique for measuring social intelligence, the average indicator for intellectual criteria by group was: EG1, 42%, EG2, 40%, EG3, 39%, EG4, 38% and CG, 40%. Next, the number of students was determined for each level of formation of the intellectual component. The data obtained is shown in Table 3.

Table 3. The percentage of the intellectual component of the studied competence.

levels	EG 1		EG 2		EG 3		EG 4		CG	
	Participant	%	Participant	%	Participant	%	Participant	%	Participant	%
Creative	8	11%	6	5%	5	7%	7	8%	8	11%
Productive	29	39%	38	51%	32	43%	28	38%	32	43%
Basic	35	47%	32	43%	35	47%	38	50%	32	43%

According to the data obtained, most of the students have a basic level and only a small part of the subjects have a creative level which confirms the need to develop the intellectual component and requires further work to be determined.

According to the level of sociability data obtained during the survey, all students participating in the experiment (to a greater or lesser extent) developed communication skills. The average score for each group is approximately the same (EG1: 16 points, EG2: 17 points, EG3: 18 points, EG4: 15 points, CG: 16 points) and corresponds to the average level.

The percentage of the activity component of the studied competence of students (stating experiments) is shown in Table 4.

Table 4. The percentage of the activity component of the studied competence.

levels	EG 1		EG 2		EG 3		EG 4		CG	
	Participant	%	Participant	%	Participant	%	Participant	%	Participant	%
Creative	0	0%	8	7%	3	4%	8	12%	8	12%
Productive	35	47%	32	43%	29	40%	29	40%	26	36%
Basic	38	51%	35	47%	41	56%	35	48%	38	52%

The average indicator of the level of activity component for each group at the beginning of the experimental work was EG1, 39.5%; EG2, 40.5%; EG3, 39%; EG4, 36% and CG, 39%.

Thus, the activity component of communicative competence among students of all groups is poorly formed, although the level of sociability is an average indicator as evidenced by the above results. Therefore, it is necessary to take further actions aimed at increasing the formation of this component to a productive or creative level.

The percentage of the reflective component of the studied competence of students (stating experiment) is shown in Table 5.

Table 5. The percentage of the reflective component of the studied competence.

Levels	EG 1		EG 2		EG 3		EG 4		CG	
	Participant	%	Participant	%	Participant	%	Participant	%	Participant	%
Creative	0	0%	0	0%	3	4%	0	0%	3	4%
Productive	35	47%	34	43%	32	43%	29	39%	28	39%
Basic	40	51%	41	55%	38	51%	44	59%	41	55%

The average indicator of the reflexive component at the beginning of the experimental work for each group has been obtained by summing the findings gathered: EG1: 39.5%; EG2: 35.5%; EG3: 33%; EG4: 39% and CG: 41%.

It should be noted that the quantitative assessment of subject-related communicative language competencies was carried out by averaging the marks according to the selected criteria. The creative level of the criterion manifestation was estimated at 3 points, the productive level of manifestation was 2 points and the base level was 1 point.

In the ascertaining experiment, we determined the average indicator of each component of the studied competence and expressed it as a percentage. The result obtained is clearly shown in Figure 1.
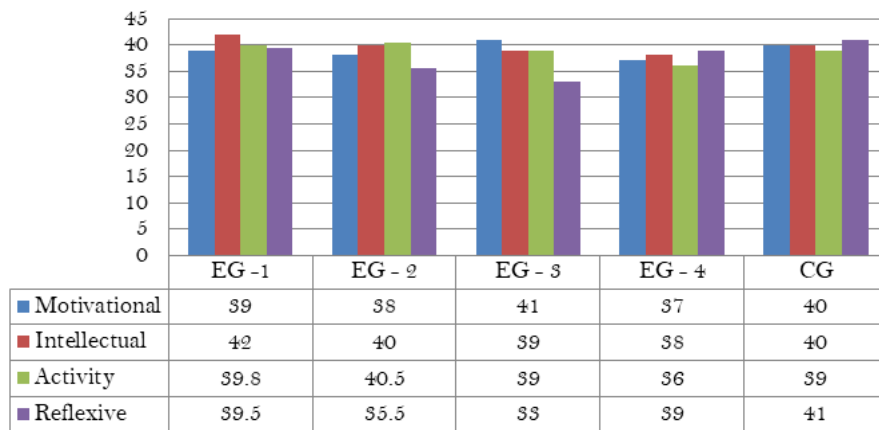
Figure 1. Summary of the studied competence by groups.

Summing up the data on four criteria, we got the average indicator of the level of competence formation under study for each group. The diagram shows the results of the determining experiment (see Figure 2).
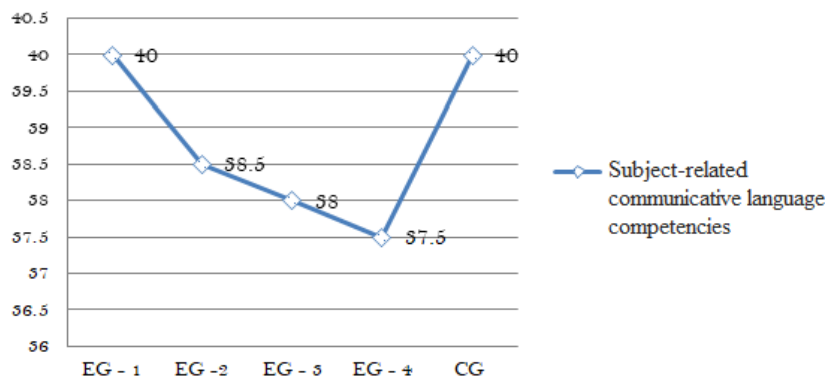

Figure 2. The degree to which competence develops under the study for each group.

The general level of the subject-related communicative language competencies of the students was also unsatisfactory. The data for all groups corresponds to the reproductive level.

According to the survey data of teachers, the following information was found:

1. Is it currently possible to do without knowledge of additional foreign languages in the modern multicultural society of Kazakhstan?

Teachers answered in the negative (80.23% of respondents) and added that in a changing world, it is impossible to not know foreign languages.

2. Do you use innovative technologies in the learning process?

59% of teachers answered no and 32% said they use them regularly. During the experiment, it was found that teachers who answered "yes" are constantly working on didactic materials improving and modernizing the learning process.

3. What are the reasons for the poor language training of students?

Most of the teachers (68%) answered that it was all about the lack of teaching hours. 25% of teachers conditioned this by the lack of initial training of students and 7% noted the lack of motivation of students which is shown in Figure 3.
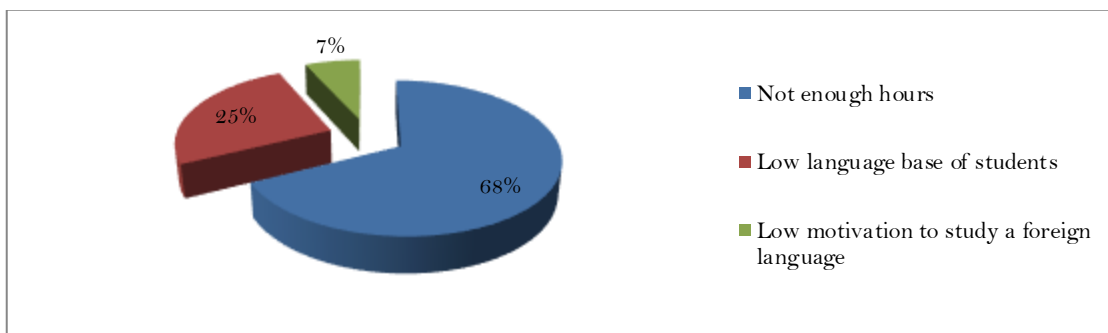

Figure 3. Reasons for the poor language training of future IT specialists.

4. What is the difficulty of introducing innovative technologies into practice when teaching a foreign language?

85% of teachers answered that they consider that the main factor is that there are no conditions in particular, an insufficient number of teaching aids and the weak material basis of the school and only 15% of teachers noted during the survey that there are no difficulties in using innovative technologies because they have access to internet resources that contain a lot of materials (see Figure 4).

The questioning of teachers and students at the ascertaining stage showed that teachers rarely use innovative forms, methods and means in their educational practice and doubt their effectiveness. At the same time, students are optimistic about the application of innovative methods and means in teaching English. In their responses to the questionnaire, students indicated that the educational process becomes more effective, interesting and informative when active methods of teaching a foreign language (English) are superior to traditional teaching methods. These findings highlight the need to create conditions to enable innovative learning for IT students. According to the survey, the above factors are the reasons for the low level of language training among IT students.
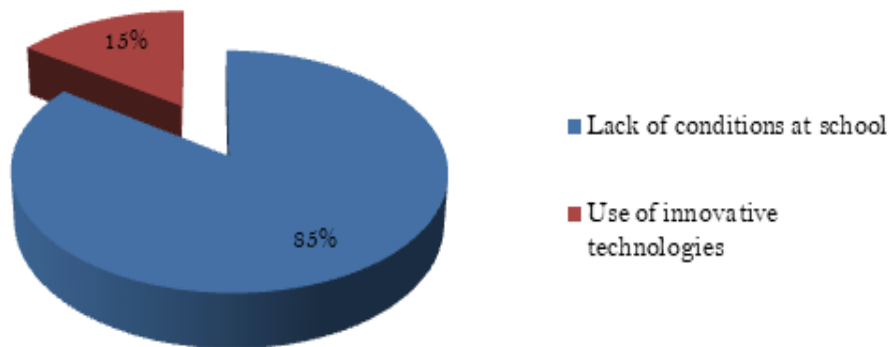
Figure 4. The difficulty of introducing innovative technologies into practice.

Thus, regarding the insufficient level of subject-related communicative language competencies among information technology degree learners, we have concluded that it is necessary to purposefully form the subject-related communicative language competence of students and determined a specific program of activities that consists of testing an author's innovative technique of learning.

According to the standard curriculum of the cycle of general education disciplines in the universities in our country, the discipline " foreign language" in courses of non-linguistic specialties is a mandatory part of the general education cycle with a duration of 5 credits per semester (150 academic hours).

This training module reflects the acceptance of the conditions for the teaching of a second language and for effective and convenient use, we have developed an electronic training manual, " communication" for the training module. The topics of this manual corresponded to the topics in the modules of the standard curriculum of the cycle of general education disciplines, "foreign language" in the non-linguistic specialties course. The lesson plans of this electronic textbook were created in three languages: English-Russian in Kazakh groups and English-Kazakh in Russian groups where the levels of students, topics, goals and stages of the lesson are taken into account (the stages are divided for the development of abilities and skills of speaking, reading, writing and listening). The main part of this lesson contains tasks using innovative technologies (inserting the correct words in the text while listening to the text in English), parallel texts, case stages (discussing the problem and making certain decisions) and debates (expressing opinions and expressing attitudes on the topic being studied). These types of tasks are designed to use innovative technology to develop reading, speaking and listening skills and to create a good sense of psychological comfort during foreign language lessons.

The educational material based on which subject-related communicative language competencies are organized according to the goals and conditions of training. The most rational way to organize educational material was through a combination of classroom and extracurricular stages of teaching language.

The emphasis on the development of subject-related communicative language competencies determines educational technologies. The corresponding learning process is implemented in two stages: proper speech and professional communication.

The improvement of communicative skills is based on teaching materials, special techniques and a series of exercises and tasks assessed according to the criteria of informativeness, ease of method, diversity of professional genres and motivation for foreign language activities.

The implementation of the condition for changing the position of the teacher from the leader to the dual position of the organizer-participant of joint educational activities with students was manifested in the expansion of the role repertoire of the teacher which includes the following roles: organizer-consultant, organizer-expert and moderator-participant. The choice of a pedagogical position is connected both with the features of a particular form of interactive learning and with the stages of its deployment. At the same time, students became significant and influential participants in the activity which manifested in such actions as initiation, choice, design, reflection, mutuality and self-assessment.

It is impossible to introduce the identified conditions and innovative technologies into the educational process without training teachers. In a nutshell, within the framework of the study, meetings were organized with English teachers from IT specialties where topical issues were discussed on identifying effective conditions and using innovative technologies.

During the discussions, the teachers concluded that the use of communicative exercises does not give a full result since students need to be allowed to think creatively to provide them with space for the development of creative ideas.

Characterizing the obtained data as a whole, we note that the author's innovative technique of learning fulfills the requirements for the results. A summary table of data at the beginning and end of the study was prepared (see Table 6).

Table 6. Comparative data by groups at the beginning and end of the study

Group	Stage	Criteria				The studied competence
		Motivational	Intellectual	Activity	Reflexive	
EG1	Start	39%	42%	39.5%	39.5%	40%
	End	57%	55%	51%	49%	53%
EG2	Start	38%	40%	40.5%	35.5%	38.5%
	End	63%	63%	58%	48%	57%
EG3	Start	41%	39%	39%	33%	38%
	End	62%	62%	53%	48%	55%
EG4	Start	37%	38%	36%	39%	37.5%
	End	68%	68%	63%	58%	66%
CG	Start	40%	40%	39%	41%	40%
	End	49%	49%	44%	43%	46%

The level of formation of IT students' subject-related communicative language competencies increased in all experimental groups. The changes that occurred in the control group were less significant. IT students' development of subject-related communicative language competencies has increased but not significantly. According to all indicators, the number of students who advanced to the middle and high levels increased by an average of 18-20%.

The impossibility of obtaining positive results without taking proposed technologies into account emphasizes the need for their implementation for the effectiveness of the author's innovative technique of learning. The experimental study's findings determine sufficiency. If the share data obtained during the experiment show a stable increase in the indicators of the formed components and a significant superiority of the EG in which all of the conditions for the implementation of the innovative technique were observed over the students of the CG, it can be concluded that the author's innovative learning technique is effective. According to the findings, we can conclude that the tasks assigned to us have been accomplished, the objectives have been achieved and the hypothesis presented has been confirmed.

5. Conclusion

The aim of this study was to assess the development of subject communicative language competencies (a) in linguistic or grammatical ability and (b) in discourse ability in first-year students for the proposed author's innovative learning technique in the educational process as well as the appropriate technological and systematic procedures. A series of tests for diagnosis were used in accordance with the following criteria: motivational, intellectual, activity and reflexive. These tools are established based on the study's theoretical requirements. An insufficient level of formation of subject-related communicative language competencies among IT students required the introduction of special means for their further formation. The formative stage of the experimental work substantiated the innovative technique introduced. In general, the students in these groups showed higher motivation, general communicative training and growth rates. They demonstrated strong subject-related communicative language capabilities as well as developed skills and abilities, confirming innovative methodology. The main indicator of the success of the author's new strategy is the rise in the level of development of the IT student's subject-related communicative language competencies. Therefore, we can conclude that the change in subject-related communicative language competencies among IT students is not caused by random reasons but is a consequence of the author's innovative technique. The conclusion of our study does not claim to be an exhaustive solution to the problem under study but we offer one of the ways to solve it which can be further developed in future research in other non-linguistic specialties.

6. Limitations and Additional Future Directions

This research focuses on the development of students' subject-related communicative language competencies among IT students as they train at university. This work does not claim to be a complete study of subject-related communicative language competencies in IT students and can be continued for the further development of technologies for intensive communicative teaching of a foreign language.

The sample for the study is drawn from the country's southern region but participation from pedagogical universities is limited. Given that pedagogical universities provide the vast majority of IT student training, including IT students from all pedagogical universities in the survey would improve the sample's representativeness.

In addition, a retrospective analysis of the concepts of language teaching in universities in Kazakhstan and worldwide will allow to highlight the following significant aspects: the goals of developing skills by types of speech activity, the predominance of types of speech activity in the classroom, the dominance of the method, taking into account the specifics of the contingent of students, preferential learning strategy, ways of interaction of subjects in the educational process, techniques for presenting educational material and structuring educational material.

References

Abragan, F., Abarcas, V., Aquino, I. M., & Bagongon, R. E. (2022). Research review on K-12 curriculum implementation in the Philippines: A generic perspective. *European Journal of Educational and Social Sciences, 7*(1), 1-8.

Achille, C., & Fiorillo, F. (2022). Teaching and learning of cultural heritage: Engaging education, professional training, and experimental activities. *Heritage, 5*(3), 2565-2593. https://doi.org/10.3390/heritage5030134

Akyildiz, S. T., & Ahmed, K. H. (2021). An overview of qualitative research and focus group discussion. *International Journal of Academic Research in Education, 7*(1), 1-15. https://doi.org/10.17985/ijare.866762

Alkhabra, Y. A., Ibrahem, U. M., & Alkhabra, S. A. (2023). Augmented reality technology in enhancing learning retention and critical thinking according to STEAM program. *Humanities and Social Sciences Communications, 10*(1), 1-10. https://doi.org/10.1057/s41599-023-01650-w

Alzahrani, N. M. (2020). Augmented reality: A systematic review of its benefits and challenges in e-learning contexts. *Applied Sciences, 10*(16), 5660. https://doi.org/10.3390/app10165660

Amsori, H., Nugraha, M. A., & Sibarani, J. (2023). The effect of task based learning method using anchor podcast application on students' speaking ability. *Eltin Journal: Journal of English Language Teaching in Indonesia, 11*(1), 67-76.

Arena, F., Collotta, M., Pau, G., & Termine, F. (2022). An overview of augmented reality. *Computers, 11*(2), 1-16.

Asghar, M. Z., Memon, S. A., & Hämäläinen, J. (2022). Evolution of wireless communication to 6g: Potential applications and research directions. *Sustainability, 14*(10), 6356. https://doi.org/10.3390/su14106356

Aspers, P., & Corte, U. (2019). What is qualitative in qualitative research. *Qualitative Sociology, 42*, 139-160. https://doi.org/10.1007/s11133-019-9413-7

Brunetti, F., Matt, D. T., Bonfanti, A., De Longhi, A., Pedrini, G., & Orzes, G. (2020). Digital transformation challenges: Strategies emerging from a multi-stakeholder approach. *The TQM Journal, 32*(4), 697-724. https://doi.org/10.1108/tqm-12-2019-0309

Busetto, L., Wick, W., & Gumbinger, C. (2020). How to use and assess qualitative research methods. *Neurological Research and Practice, 2*(1), 1-10. https://doi.org/10.1186/s42466-020-00059-z

Chassignol, M., Khoroshavin, A., Klimova, A., & Bilyatdinova, A. (2018). Artificial intelligence trends in education: A narrative overview. *Procedia Computer Science, 136*, 16-24. https://doi.org/10.1016/j.procs.2018.08.233

Chauhan, C., Parida, V., & Dhir, A. (2022). Linking circular economy and digitalisation technologies: A systematic literature review of past achievements and future promises. *Technological Forecasting and Social Change, 177*, 121508. https://doi.org/10.1016/j.techfore.2022.121508

Corner, E. J., Murray, E. J., & Brett, S. J. (2019). Qualitative, grounded theory exploration of patients' experience of early mobilisation, rehabilitation and recovery after critical illness. *BMJ Open, 9*(2), e026348. https://doi.org/10.1136/bmjopen-2018-026348

Cuenca-López, J. M., Martín-Cáceres, M. J., & Estepa-Giménez, J. (2021). Teacher training in heritage education: Good practices for citizenship education. *Humanities and Social Sciences Communications, 8*(1), 1-8. https://doi.org/10.1057/s41599-021-00745-6

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems, 49*(1), 5-22. https://doi.org/10.1177/0047239520934018

Döbler, A.-S., Emmermacher, A., Richter-Killenberg, S., Nowak, J., & Wegge, J. (2022). New insights into self-initiated work design: The role of job crafting, self-undermining and five types of job satisfaction for employee's health and work ability. *German Journal of Human Resource Management, 36*(2), 113-147. https://doi.org/10.1177/23970022211029023

Dos Santos, L. (2021). Developing bilingualism in nursing students: learning foreign languages beyond the nursing curriculum. *Healthcare, 9*(3), 326-326. https://doi.org/10.3390/healthcare9030326

Gilch, P. M., & Sieweke, J. (2021). Recruiting digital talent: The strategic role of recruitment in organisations' digital transformation. *German Journal of Human Resource Management, 35*(1), 53-82. https://doi.org/10.1177/2397002220952734

Gronseth, S., & Hebert, W. (2019). GroupMe: Investigating use of mobile instant messaging in higher education courses. *TechTrends, 63*(1), 15-22. https://doi.org/10.1007/s11528-018-0361-y

Hamidi, H., & Chavoshi, A. (2018). Analysis of the essential factors for the adoption of mobile learning in higher education: A case study of students of the university of technology. *Telematics and Informatics, 35*(4), 1053-1070. https://doi.org/10.1016/j.tele.2017.09.016

Iglesias-Pradas, S., Hernández-García, Á., Chaparro-Peláez, J., & Prieto, J. L. (2021). Emergency remote teaching and students' academic performance in higher education during the COVID-19 pandemic: A case study. *Computers in Human Behavior, 119*, 106713. https://doi.org/10.1016/j.chb.2021.106713

Ilie, O. A. (2019). *The intercultural competence. Developing effective intercultural communication skills*. Paper presented at the International Conference Knowledge-Based Organization.

Jääskä, E., Lehtinen, J., Kujala, J., & Kauppila, O. (2022). Game-based learning and students' motivation in project management education. *Project Leadership and Society, 3*, 100055. https://doi.org/10.1016/j.plas.2022.100055

Khosravi, H., Shum, S. B., Chen, G., Conati, C., Tsai, Y.-S., Kay, J., . . . Gašević, D. (2022). Explainable artificial intelligence in education. *Computers and Education: Artificial Intelligence, 3*, 100074. https://doi.org/10.1016/j.caeai.2022.100074

Kiessling, C., & Fabry, G. (2021). What is communicative competence and how can it be acquired? *GMS Journal for Medical Education, 38*(3), Doc49-Doc49. https://doi.org/10.3205/zma001445

Kim, J., Lee, H., & Cho, Y. H. (2022). Learning design to support student-AI collaboration: Perspectives of leading teachers for AI in education. *Education and Information Technologies, 27*(5), 6069-6104. https://doi.org/10.1007/s10639-021-10831-6

Kim, S., Raza, M., & Seidman, E. (2019). Improving 21st-century teaching skills: The key to effective 21st-century learners. *Research in Comparative and International Education, 14*(1), 99-117. https://doi.org/10.1177/1745499919829214

Köşker, G., & Gülmez, G. (2018). The role of the teacher in building intercultural communication skills in foreign language teaching: Teachers' views with examples from France and Turkey. *Eğitimde Nitel Araştırmalar Dergisi, 6*(1), 157-171. https://doi.org/10.14689/issn.2148-2624.1.6c1s7m

Kuhail, M. A., Alturki, N., Alramlawi, S., & Alhejori, K. (2023). Interacting with educational chatbots: A systematic review. *Education and Information Technologies, 28*(1), 973-1018. https://doi.org/10.1007/s10639-022-11177-3

Lapitan Jr, L. D., Tiangco, C. E., Sumalinog, D. A. G., Sabarillo, N. S., & Diaz, J. M. (2021). An effective blended online teaching and learning strategy during the COVID-19 pandemic. *Education for Chemical Engineers, 35*, 116-131. https://doi.org/10.1016/j.ece.2021.01.012

Li, L. (2022). Reskilling and upskilling the future-ready workforce for industry 4.0 and beyond. *Information Systems Frontiers*, 1-16. https://doi.org/10.1007/s10796-022-10308-y

Lu, T., Sanitah, M. Y., & Huang, Y. (2022). Role of self-efficacy and resistance to innovation on the demotivation and insufficient learning capabilities of preservice English normal students in China. *Frontiers in Psychology, 13*, 923466. https://doi.org/10.3389/fpsyg.2022.923466

MacIntyre, P. D., & Wang, L. (2021). Willingness to communicate in the L2 about meaningful photos: Application of the pyramid model of WTC. *Language Teaching Research, 25*(6), 878-898. https://doi.org/10.1177/13621688211004645

Motta, S. C., & Bennett, A. (2018). Pedagogies of care, care-full epistemological practice and 'other' caring subjectivities in enabling education. *Teaching in Higher Education, 23*(5), 631-646. https://doi.org/10.1080/13562517.2018.1465911

Nagima, B., Saniya, N., Gulden, Y., Saule, Z., Aisulu, S., & Nazigul, M. (2023). Influence of special learning technology on the effectiveness of pedagogical ethics formation in future teachers. *Journal of Education and e-Learning Research, 10*(1), 1-6.

Nurgaliyeva, S., Iztleuova, Z., Maigeldiyeva, S., Zhussupova, Z., Saduakas, G., & Omarova, G. (2023). Examining the relationships between teachers' job satisfaction and technological competencies. *International Journal of Education in Mathematics, Science, and Technology, 11*(4), 898-912. https://doi.org/10.46328/ijemst.3375

Peterson, J. S. (2019). Presenting a qualitative study: A reviewer's perspective. *Gifted Child Quarterly, 63*(3), 147-158. https://doi.org/10.1177/0016986219844789

Pratiwi, D. I., Ubaedillah, U., Puspitasari, A., & Arifianto, T. (2022). Flipped classroom in online speaking class at Indonesian university context. *International Journal of Instruction, 15*(2), 697-714. https://doi.org/10.29333/iji.2022.15238a

Safitri, H., Rafli, Z., & Dewanti, R. (2020). Improving students' speaking skills through task-based learning: An action research at the English department. *International Journal of Multicultural and Multireligious Understanding, 7*(6), 88-99. https://doi.org/10.18415/ijmmu.v7i6.1647

Savignon, S. J. (2018). Communicative competence. *The TESOL Encyclopedia of English Language Teaching*, 1-7. https://doi.org/10.1002/9781118784235.eelt0047

Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research, 104*, 333-339. https://doi.org/10.1016/j.jbusres.2019.07.039

Tang, Y., & Hew, K. F. (2022). Effects of using mobile instant messaging on student behavioral, emotional, and cognitive engagement: A quasi-experimental study. *International Journal of Educational Technology in Higher Education, 19*(1), 1-22. https://doi.org/10.1186/s41239-021-00306-6

Whyte, S. (2019). Revisiting communicative competence in the teaching and assessment of language for specific purposes. *Language Education & Assessment, 2*(1), 1-19. https://doi.org/10.29140/lea.v2n1.33

Xu, L., & Xiao, Y. (2023). Students' perceptions of native/non-native English-speaking EMI teachers: Are NS teachers better than NNS teachers? *Frontiers in Education, 7*, 1082600. https://doi.org/10.3389/feduc.2022.1082600

Zhumash, Z., Zhumabaeva, A., Nurgaliyeva, S., Saduakas, G., Lebedeva, L. A., & Zhoraeva, S. B. (2021). Professional teaching competence in preservice primary school teachers: Structure, criteria and levels. *World Journal on Educational Technology: Current Issues, 13*(2), 261-271. https://doi.org/10.18844/wjet.v13i2.5699